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EDUCATION AND JOB MATCH: REVISITED

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Abstract

To study the changes in the effect of degree field on mismatch and the change in the effect of mismatch of wages over time, we revisit a study by Robst (2006) who found that workers who are mismatched earn less than adequately match workers with the same amount schooling. Using recent data from 2015 National Survey of College Graduate (NSCG), we also find a negative relationship between the case of mismatch and the outcome of workers in term of wages, even though the degree of mismatch doesn't seem to matter as much.

Keywords

education, occupational mismatch, horizontal mismatch, economics, economics of education

Cover Page Footnote

1. Introduction

With recent scrutiny surrounding the rising costs of higher education in the United States, it has become extremely important for students to make economically beneficial choices while in school and in the years following graduation. The wage effects of overeducation/undereducation in the American labor market has been a focus for many researchers in the area of educational economics. There is much less research, however, on mismatch between field of study and occupation- which we will refer to as horizontal mismatch. One of the first papers to investigate this type of mismatch was done by Robst[1], which showed that negative wage effects do exist for horizontal mismatch. These effects differ between fields of study, as does the probability of being horizontally mismatched. Robst used data from the National Survey of College Graduates and found that having a job with no relation to one's field of study will result in about a 10% decrease in annual salary, for both genders. This wage effect lessens, to about 2%, when there is some relation between occupation and degree field. Similar results have been found in Sweden, which has a more specialized higher education system than the United States[2]. A paper that used data from France did not find negative wage effects for horizontal mismatch, however, there was a decrease in job satisfaction[3].

Using similar methods to Robst, but with more recent data, this paper contributes a modern view on the role of horizontal mismatch to the current discussion. We again examine the effect of field of study on the probability of being mismatched, along with the wage effects of mismatch. We also attempt to expand on Robst's original paper by looking at how wage effects differ across

[1] John Robst. "Education and job match: The relatedness of college major and work." *Economics of Education Review 26*.4 (2007)
[2] Martin Nordin, Inga Persson, and Dan-Olof Rooth. "Education-occupation mismatch: Is there an income penalty?" *Economics of Education Review 29*.6 (2010)
[3] Catherine Béduwé, and Jean- François Giret. "Mismatch of vocational graduates: What penalty on french labour market?" *Journal of Vocational Behavior 78*.1 (2011)

age groups. We (incorrectly) hypothesized that the negative wage consequences of being horizontally mismatched will lessen in severity with each successive age group. Our reasoning for this hypothesis was that even if someone's principal occupation is unrelated to their highest degree field of study, he or she will presumably spend their career bridging the gap between the knowledge required for their occupation and knowledge gained from their highest degree. An implicit assumption in determining the wage consequences of horizontal occupational mismatch is that any negative wage consequences stem as a result of not gaining the requisite knowledge required for one's principal occupation during the pursuance of his or her highest degree. As individuals further advance in their careers, they will gain the knowledge and expertise required to sufficiently perform in their principal occupation, thus the adverse wage consequences of not being adequately or appropriately trained in a collegiate environment should diminish over the course of one's career.

2. Background

The majority of the current research pertaining to the topic of educational and occupational mismatch focuses on vertical mismatch, or the amount of schooling obtained relative to the amount of schooling required by an occupation. The negative wage effects of overeducation are well-documented. Regardless of how overeducation is measured, whether subjectively by respondents or more objectively with some quantitative measures, the results are qualitatively the same throughout the literature in that the returns to surplus of schooling are lower than the returns to required schooling.

Few researchers have explicitly delved into exploring the effects of occupational mismatch with regards to *type* of education rather than *amount* of education. Of the few who have, many have used data pertaining to labor markets outside of the United States. Nordin, Perssona, and Rooth found that men who are completely mismatched within their occupations in Sweden experience a much more severe negative wage effect than do mismatched men in the United States[4]. This may be attributable in part to the more specialized higher-education system in Sweden, making skills learned in higher-education in Sweden less transferrable across professions thus corroborating the more severe wage consequences that the data suggest. This explanation is not definitive, merely suggestive. Women, however, experience almost the same income penalties in both Sweden and the United States (12% in Sweden versus 10% in the U.S.). Regardless of magnitude, their findings were qualitatively the same as ours in that there is a statistically significant negative wage penalty for being mismatched in one's occupations

On the other hand, Béduwé and Giret presented contrary findings. They explored the consequences of both vertical and horizontal mismatch. They found that vertical mismatch results in negative wage impacts; a finding consistent with the literature. Unlike our paper and Robst's paper, Béduwé and Giret found that horizontal mismatch does not have any negative wage consequences[5]. They did find, however, that horizontal mismatch increases job dissatisfaction and the desire to find another job, even if the current job is qualified, permanent, and well-compensated. Our paper will further contribute in the effort to come to a consensus on the labor market consequences of *quality* of educational mismatch (in terms of the type of education received compared to type of education required) as opposed to *quantity* of educational mismatch (in terms of the amount of education received compared to amount of education required).

3. Data

Our data comes from the 2015 National Survey of College Graduates (NSCG), a survey conducted by the National Center for Science and Engineering Statistics. Respondents must hold

[4] Martin Nordin, Inga Persson, and Dan-Olof Rooth. "Education-occupation mismatch: Is there an income penalty?" *Economics of Education Review 29*.6 (2010)
[5] Catherine Béduwé, and Jean- François Giret. "Mismatch of vocational graduates: What penalty on french labour market?" *Journal of Vocational Behavior 78*.1 (2011)

at least a bachelor's degree and be living in the United States. The NSCG oversamples young graduates as this is a population of interest in the United States. We will weight our observations to ensure that our sample is nationally-representative. The survey asks respondents if their current occupation is closely related, somewhat related, or not related to the field of study for their highest degree. "Somewhat related" is interpreted as partial mismatch, while "not related" is interpreted as complete mismatch. Our sample consists of the 76,814 individuals that responded to the NSCG's question on mismatch.

Due to the large number of options for field of study, we regrouped the different fields of study into 24 categories. We are assuming that these groupings are fairly similar to the groupings used by Robst so that our results may be compared. We use the field of study for the individual's highest degree, as that is what the NSCG specifically references. Robst, however, used the respondent's most recent degree field. This is likely a minute difference as a majority of respondents' most recent degree is also their highest degree.

4. Methodology

Our methodology follows Robst's methodology very closely. For clarity purposes, we give the two equations that provide the basis for the bulk of Robst's work. First, we use an ordered logit model to investigate the probability of being mismatched:

$$Pr(Mismatch)_{ij} = X_{ij} + Z_j\alpha + \varepsilon_{ij},$$

where X_{ij} represents a variety of demographic variables for individual *i* in degree field *j*, and Z_j denotes the degree field. Second, we use OLS regression to examine the wage effects of mismatch:

$$LnW_i = X_{ij}\beta + Z_j\alpha + Partial_{ij}\delta + Complete_{ij}\mu + \varepsilon_i$$

Where, again, X includes a vector of demographic variables for individual *i* in degree field *j*, Z denotes the degree field. *Partial* denotes the person is partially mismatched, and *Complete* denotes the person is completely mismatched. All regressions are weighted using the survey weights from the NSCG and all run separately for men and women.

Robst includes several different specifications to test his variety of hypotheses. After running the log wage regression, we include an interaction between mismatch and each degree field, in order to examine how the wage effects differ across majors. We repeat this specification and include an additional specification of our own. As previously mentioned, we hypothesize that the negative wage effects of being horizontally mismatched will lessen in severity with each successive age group due to the ability for one to bridge the gap between their college education and current occupation over time. In order to test this hypothesis, we run the log wage regression for different age blocks (23-33, 33-43, and so on until the final age block of 63-76).

5. Results

5.1 College Major and the Likelihood of Being Mismatched

Table 1 contains results from the ordered logit regression. Relative to the field of computer science, all of the majors in Robst's paper had a greater likelihood of mismatch with the exceptions of library science and health professions. In our results, the coefficients on both library science and health professions are insignificant, and there are no statistically significant degree fields which have a lower likelihood of being mismatched relative to computer science. Some of the degree fields with the highest likelihoods of mismatch in Robst's paper were english and foreign languages, social sciences, and liberal arts. These findings remain true in our replication as well, however there are a few additional degree fields whose likelihoods of mismatch are just as high, if not higher. Public affairs actually has a higher chance of mismatch than does social science, and home economics has the highest odds of mismatch of any degree field.

While this paper's main focus is to extrapolate the influence of degree fields on the likelihood of occupational mismatch, we briefly discuss some other findings. The likelihood of becoming mismatched decreases as the level of the highest degree increases (with a bachelor's degree being considered the "lowest" level and a professional degree being considered the "highest" level). Age is statistically insignificant in influencing the probability of being mismatched in one's occupation. Being disabled and never having been married both increase the likelihood of being occupationally mismatched. Finally, the likelihood of being occupationally mismatched is higher for Asians and Whites than for other ethnicities. These findings are consistent with Robsts', except for age which he found to have a positive influence on the likelihood of occupational mismatch.

5.2 Implications for Returns to Schooling

Table 2 shows the results from running the wage regression without including interaction terms between degree fields and the mismatch variables in the regression. As we suspected, the wage consequences of being partially mismatched are less severe than being completely mismatched for both men and women. This suggests that as the transferability of skills from one's degree field to their occupation increases, the negative effects of occupational mismatch decrease. One notable difference between the men and women in the sample is that it seems that each degree type (e.g. bachelors, masters, doctorate, and professional) has a more positive effect on wage for men with the exception of a doctorate degree. This insinuates that females who hold doctorate degrees make more, on average, than comparable men with the same doctorate ceteris paribus. Perhaps these differences can be explained by childbearing and child care decisions made by females. If females typically exit the labor market to bear children, and if they decide to stay at home to care for those children until mid-adolescence to adulthood, then females will not accumulate the professional experience and expertise of their male counterparts who typically do not leave the labor market after fathering children. Therefore, holding the same degrees as males will command less wages for females re-entering the labor market because they will not have the same experience as their male counterparts. Of course, if this were the case, one would expect that every degree type has a more positive effect on wage for males than females, including a doctorate. Although the discrepancy in the wage effect between males and females of holding a doctorate may provide a counterargument to the childbearing and child care hypothesis, the coefficients on complete mismatch and partial mismatch might actually provide support in favor of it. The wage consequences of being completely and partially mismatched are less severe for females than for males. If the childbearing and child care hypothesis is correct in its assertion that women exit the labor market at higher rates than men and subsequently re-enter the labor market many years later in their careers whereas men continue their careers more uninterrupted than do women, then we would exactly expect the severity of occupational mismatch to be less severe for females. Since women re-entering the labor market command lower wages than their male counterparts with similar academic backgrounds to begin with (with the exception of females with doctorates), they stand to lose less by deviating towards an occupation unrelated to their highest degree field of study. In other words, since females re-entering the labor market command lower wages to begin with (even in a field related to their highest degree field of study), the difference in the wage that females would receive by pursuing a field unrelated to their highest degree is not as much as that difference would be for men. That is, since men have more continuous overall, they stand to lose more in terms of wage by shifting to an occupational field for which they did not spend their careers accumulating experience and expertise.

Table 3 shows the results from running a separate wage regression than that of Table 2, this time including interaction terms between each degree field and the mismatch categorical variables in the regression. Since the aim of including interaction terms was to discern the wage effects of being mismatched for each degree field, we only display the coefficients on the interaction terms rather than the total results of the regression. All of the coefficient displayed are relative to the degree field of computer science, which was arbitrarily chosen to be the base degree field and thus omitted in the regression to avoid perfect collinearity. For our discussion, we will focus on the coefficients between the "complete mismatch" variable and each degree field, as we are most interested in the wage effects of total unrelatedness to highest degree field of study.

Perhaps the main takeaway from these results are that not a single degree field suffers a worse wage consequence for being completely mismatched than computer science (as indicated by mostly positive coefficients, suggesting that those degree fields suffer a less negative wage consequence of complete mismatch). All of the negative coefficients in these results are statistically no different from zero. This result holds apparent for both males and females. In other words, the results indicate that the degree field of computer science suffers the worst wage consequences of being occupationally mismatched compared to any other degree field. This is somewhat consistent with Robst's findings in that he too found that computer science experienced some of the worst wage consequences of any degree field for being completely occupationally mismatched. Recall one of our previous claims regarding transferability of skills in terms of its implications for the wage consequences of complete occupational mismatch. Specifically, we claimed that degree fields that provide very occupation-specific skills (i.e. presumably very non transferable skills), should suffer worse wage consequences of being completely occupationally mismatched than degree fields that provide general skills (i.e. presumably somewhat transferable skills). Computer science provides, almost indisputably, very specific technical skills. Therefore, these results corroborate our assertion that transferability of skills has direct consequences on the wage penalties of being occupationally mismatched. Unlike Robst's paper, however, our results indicate that computer science experiences the absolute worst wage consequences of complete occupational mismatch. Robst found that numerous other degree fields actually experience worse wage penalties for occupational mismatch as compared to computer science. One possible explanation could be that as technology has exponentially progressed, computer science has become astronomically more lucrative than other degree fields. Therefore, the wage consequences of pursuing an occupation unrelated to computer science when one has the qualifications for computer science are financially dire.

5.2.1 Separating Regressions by Age Group In Addition to Gender

One aspect that differentiates this paper from the other literature exploring horizontal mismatch is that we estimated the wage consequences of horizontal mismatch by age group (in conjunction with gender), where we separated the age groups by decade starting with age 23. The age of the youngest observation in our sample was 16. Although everyone in the sample has a minimum of a bachelor's degree, we omitted the age bracket below the age of 23 as a formality due to the atypical nature for someone under the age of 23 having completed a college degree. There are only 15 observations in our sample under the age of 23, so cutting off the age bracket in this manner does not qualitatively change the results. We stopped the final age bracket at age 76 because this was the age of the oldest observation in our sample.

The story for females is a bit different from the males. At first, the wage consequences of being completely mismatched in one's occupation become more severe with each successive age group up until the 43 to 53 age group. However, the adverse effects of horizontal mismatch on wage decrease in severity beginning with the 53 to 63 age group. These results, like the males, are not entirely consistent with our original hypothesis that the negative consequences of mismatch should decrease as the age group increases.

One possibility as to why these findings are inconsistent with our hypothesis regarding age and the wage consequences of mismatch is because our hypothesis implicitly assumes that all instances of mismatch within the sample occurred with the individual's principal job obtained upon soonest upon completion of their highest degree, therefore they would have the remainder of their careers to bridge the gap and mitigate the negative wage consequences of their occupational mismatch. If some observations had become mismatched later in their careers however, for example from a career change, then the notion that the negative consequences of horizontal mismatch should diminish with age, or more specifically, with advancement within one's own career, does not necessarily hold true

6. Conclusion

Robst paved the way for further study on the effects of horizontal mismatch. While we expected to see the same general findings in the modern labor market, we were interested to find changes in magnitude of the original effects found by Robst. Since 1993, the United States has experienced higher rates of college attendance and the rapid growth of the internet. The latter has made the world more tech-based than ever before, and it has also allowed employers and employees alike to be extremely well connected with the job market.

Overall our findings are fairly consistent with the original paper. Computer science is the degree field with the lowest probability of mismatch, excluding statistically insignificant results. This is a slight change from the original paper which found health professions to have the probability of mismatch. This seems logical due to the emphasis on tech in the current labor market. We still see the same trend of more general majors being associated with higher probability of mismatch, however we did have a fair amount of insignificance in our results.

The biggest change we see from Robst's paper is the large increase in the negative wage effects of mismatch. Robst found that complete mismatch was associated with around a 10% decrease in annual wages for both men and women, while partial mismatch is around a 2% decrease. We find much larger decrease in the 2015 data. Our results show that complete mismatch is associated with over a 30% decrease in annual salary for both genders, and partial mismatch is associated with a 10-13% decrease. As Robst stated in his paper, mismatch does not indicate an inefficient labor market. The increase in negative wage effects of mismatch still may be worrisome, especially coupled with the ever-rising costs of education. If an individual decides to invest in their education, it is now more pertinent than ever to consider the post-graduation applicability of chosen one's major. It would be smart to consider one's commitment to a particular career path and be aware of current employment opportunities before settling on a field of study.

Since we are using the same models as Robst, we encounter the same issues with our findings that Robst outlined in his conclusion. It was suggested that there may be an endogeneity problem due to a negative relationship between ability and being mismatched. Robst's main argument to confront these concerns is that this concern mainly would apply to cases where mismatch is due to Jobs in one's degree field not being available. like Robst, we find that only around 20% of mismatched respondents indicated that this was the reason for their mismatch. So, we will maintain our interpretation of our results.

Appendix

Table 1- Ordered Logit results

	Male			Female		
	Coefficient	Std. err.	Odds	Coefficient	Std. err.	Odds
Intercept(1)	1.118	0.498	1.118	0.553 NS	0.479	0.553 NS
Intercept(2)	2.594	0.505	2.594	1.837	0.479	1.837
Degree						
Masters	-0.700	0.066	0.497	-0.865	0.068	0.421
Professional	-2.479	0.264	0.084	-2.188	0.328	0.112
Doctoral	-1.804	0.100	0.165	-1.490	0.157	0.225
Demographics						
Age	0.007 NS	0.021	1.008 NS	0.005 NS	0.021	1.005 NS
Age sqrd.	0.000 NS	0.000	1.000 NS	0.000 NS	0.000	1.000 NS
Disabled	0.178	0.085	1.195	0.17 10	0.102	1.186 10
Black	0.159 NS	0.121	1.173 NS	0.091 NS	0.130	1.096 NS
Asian	0.247	0.104	1.280	-0.080 NS	0.129	0.924 NS
Native	-0.302 NS	0.296	0.739 NS	0.055 NS	0.408	1.057 NS
Hispanic	-0.095 NS	0.155	0.910 NS	0.003 NS	0.119	1.003 NS
Pacific	-0.770 NS	0.513	0.463 NS	-0.977 10	0.524	0.376 10
Foreign born US citizen	-0.076 NS	0.093	0.926 NS	0.259 10	0.133	1.296 10
Foreign born non-US citizen	-0.403	0.159	0.669	0.085 NS	0.180	1.089 NS
Never Married	0.315	0.100	1.370	0.301	0.081	1.352
Degree field						
Agricultural sciences	1.051	0.216	2.860	1.068	0.293	2.910
Architecture	-0.252 NS	0.194	0.778 NS	0.172 NS	0.312	1.188 NS
Biological sciences	0.857	0.147	2.355	0.178 NS	0.178	1.195 NS
Business management	0.608	0.106	1.837	0.264 10	0.146	1.302 10
Communications	0.973	0.223	2.646	0.556	0.187	1.743
Education	0.669	0.171	1.952	-0.453	0.152	0.636
Engineering	0.336	0.092	1.400	0.276 10	0.155	1.317 10
Engineering-related technologies	0.915	0.181	2.496	0.679 NS	0.646	1.972 NS
English and foreign languages	1.699	0.236	5.468	0.555	0.198	1.742
Health professions	0.092 NS	0.200	1.096 NS	-0.805	0.148	0.447
Home Economics	2.812	0.693	16.648	0.509 NS	0.337	1.663 NS
Law/prelaw/legal studies	0.842	0.301	2.322	0.622 10	0.369	1.862 10
Liberal arts	2.044	0.228	7.718	0.665	0.283	1.944
Library sciences	0.026 NS	0.831	1.026 NS	-0.768	0.357	0.464
Mathematics	0.668	0.159	1.951	-0.074 NS	0.183	0.929 NS
Philosophy/religion/theology	1.156	0.323	3.176	0.747 NS	0.551	2.111 NS
Physical sciences	0.957	0.138	2.605	0.361 NS	0.236	1.435 NS
Psychology	1.438	0.142	4.211	0.643	0.146	1.902
Public affairs	1.622	0.147	5.065	1.103	0.167	3.012
Social sciences	1.407	0.144	4.085	1.053	0.153	2.867
Social Work	0.475 NS	0.308	1.608 NS	-0.457	0.222	0.633
Visual and performing arts	1.026	0.258	2.791	0.836	0.193	2.308
Observations		40,787			33,682	

Notes: Data 2015 National Survey of College Graduates. Coefficients are significant at the 5% level unless otherwise noted; 10 indicates significance at the 10% level; ns indicates not significant at the 10% level.

Table 2- Wage Regression results

	Male		Female	
	Coefficient	Std. err.	Coefficient	Std. err.
Intercept	11.380	0.057	10.82	0.087
Mismatch				
Work not related to degree	-0.452	0.041	-0.382	0.039
Work somewhat related to degree	-0.105	0.024	-0.138	0.034
Degree				
Masters	0.145	0.025	0.138	0.029
Professional	0.733	0.075	0.588	0.066
Doctoral	0.263	0.042	0.401	0.043
Demographics				
Age	0.001	0.001	0.002[10]	0.001
Disabled	-0.183	0.041	-0.197	0.049
Black	-0.277	0.046	-0.001[NS]	0.039
Asian	-0.076	0.037	0.121	0.057
Native	-0.435	0.179	0.125[NS]	0.179
Hispanic	-0.199	0.051	-0.051[NS]	0.049
Pacific	0.038[NS]	0.146	0.337	0.137
Foreign born US citizen	0.042[NS]	0.033	-0.062[NS]	0.059
Foreign born non-US citizen	-0.132	0.051	-0.184	0.068
Never Married	-0.396	0.031	-0.125	0.035
Training				
Received Training	0.135	0.0230	0.299	0.0309
Degree field				
Agricultural sciences	-0.341	0.098	-0.254	0.114
Architecture	-0.286	0.072	-0.568	0.190
Biological sciences	-0.336	0.044	-0.297	0.075
Business management	-0.094	0.032	-0.099[NS]	0.074
Communications	-0.257	0.071	-0.208	0.099
Education	-0.651	0.067	-0.602	0.074
Engineering	0.015[NS]	0.026	0.040[NS]	0.092
Engineering-related technologies	-0.193	0.080	-0.101[NS]	0.160
English and foreign languages	-0.516	0.129	-0.518	0.115
Health professions	-0.285	0.061	-0.269	0.070
Home Economics	0.493[NS]	0.478	-0.806	0.190
Law/prelaw/legal studies	-0.563	0.099	-0.339	0.100
Liberal arts	-0.193	0.082	-0.667	0.126
Library sciences	-0.540	0.245	-0.474	0.105
Mathematics	-0.309	0.055	-0.159[NS]	0.106
Philosophy/religion/theology	-0.807	0.105	-0.617	0.157
Physical sciences	-0.236	0.053	-0.305	0.098
Psychology	-0.366	0.065	-0.478	0.080
Public affairs	-0.181	0.079	-0.197	0.099
Social sciences	-0.214	0.048	-0.292	0.078
Social Work	-0.526	0.070	-0.565	0.083
Visual and performing arts	-0.644	0.109	-0.652	0.122
Observations	40,593		33,555	
R-squared	0.203		0.146	

Notes: Data 2015 National Survey of College Graduates. Coefficients are significant at the 5% level unless otherwise noted; 10 indicates significance at the 10% level; ns indicates not significant at the 10% level

Table 3- Wage regression interactions

	Male		Female	
	Coefficient	Std. err.	Coefficient	Std. err.
*Partial Mismatch*Degree field*				
Agricultural sciences	0.184^{NS}	0.285	0.602	0.254
Architecture	0.020^{NS}	0.270	-0.193^{NS}	0.635
Biological sciences	0.272	0.104	0.415	0.197
Business management	-0.036^{NS}	0.066	0.438	0.181
Communications	0.293	0.143	0.425	0.222
Education	0.220^{NS}	0.157	0.268^{NS}	0.201
Engineering	0.144	0.059	0.503	0.192
Engineering-related technologies	0.152^{NS}	0.152	0.255^{NS}	0.280
English and foreign languages	0.232^{NS}	0.235	0.704	0.275
Health professions	-0.192	0.113	0.269^{NS}	0.184
Home Economics	1.502	0.658	-0.013^{NS}	0.601
Law/prelaw/legal studies	-0.739	0.260	0.447	0.220
Liberal arts	0.384	0.197	0.567	0.311
Library sciences	0.351^{NS}	0.359	0.267^{NS}	0.377
Mathematics	0.141^{NS}	0.139	0.538	0.229
Philosophy/religion/theology	0.255^{NS}	0.260	-0.339^{NS}	0.383
Physical sciences	0.234	0.135	0.515	0.239
Psychology	0.504	0.147	0.445	0.201
Public affairs	0.263^{NS}	0.217	0.515	0.252
Social sciences	0.305	0.104	0.672	0.187
Social Work	0.279	0.161	0.134^{NS}	0.276
Visual and performing arts	0.192^{NS}	0.183	0.732	0.347
*Complete Mismatch*Degree field*				
Agricultural sciences	0.355	0.185	0.860	0.291
Architecture	0.773	0.219	0.498^{NS}	0.479
Biological sciences	0.565	0.155	0.727	0.222
Business management	0.010^{NS}	0.152	0.435	0.226
Communications	0.492	0.225	0.296^{NS}	0.293
Education	0.199^{NS}	0.249	0.698	0.225
Engineering	0.095^{NS}	0.147	0.071^{NS}	0.332
Engineering-related technologies	0.431^{NS}	0.264	-0.115^{NS}	0.235
English and foreign languages	0.427^{NS}	0.319	1.365	0.303
Health professions	0.015^{NS}	0.193	0.259^{NS}	0.230
Home Economics	2.279	0.610	0.539^{NS}	0.406
Law/prelaw/legal studies	-0.131^{NS}	0.240	0.198^{NS}	0.300
Liberal arts	0.801	0.247	1.047	0.320
Library sciences	-0.462^{NS}	0.720	0.844	0.421
Mathematics	0.333	0.180	0.501^{NS}	0.307
Philosophy/religion/theology	1.033	0.237	1.381	0.336
Physical sciences	0.429	0.193	0.862	0.272
Psychology	0.654	0.175	1.039	0.224
Public affairs	0.759	0.243	1.019	0.272
Social sciences	0.685	0.162	0.910	0.226
Social Work	0.367^{NS}	0.301	0.536	0.247
Visual and performing arts	0.611	0.327	1.576	0.263
Observations	40,593		33,555	
R-squared	0.221		0.173	

Notes: Data 2015 National Survey of College Graduates. Coefficients are significant at the 5% level unless otherwise noted; 10 indicates significance at the 10% level; ns indicates not significant at the 10% level.

. Table 4- Wage Regressions by Age Group

	Coefficients and Standard Deviations				
	Females (Aged 23-33)	Females (Aged 33-43)	Females (Aged 43-53)	Females (Aged 53-63)	Females (Aged 63-76)
Complete Mismatch	-0.393	-0.427	-0.542	-0.343	-0.141[NS]
	(0.0646)	(0.0859)	(0.0700)	(0.0814)	(0.142)
Partial Mismatch	-0.177	-0.0563[NS]	-0.118	-0.240	-0.103[NS]
	(0.0612)	(0.0572)	(0.0508)	(0.0748)	(0.140)
Constant	9.589	10.900	10.820	12.270	13.370
	(0.364)	(0.284)	(0.344)	(0.519)	(1.153)
Observations	13,075	9,059	6,620	5,725	1,994
R-squared	0.248	0.135	0.151	0.153	0.216

	Coefficients and Standard Deviations				
	Males (Aged 23-33)	Males (Aged 33-43)	Males (Aged 43-53)	Males (Aged 53-63)	Males (Aged 63-76)
Complete Mismatch	-0.253	-0.407	-0.428	-0.498	-0.736
	(0.0750)	(0.0770)	(0.0677)	(0.0869)	(0.132)
Partial Mismatch	-0.0334[NS]	-0.0745[10]	-0.169	-0.161	-0.161[NS]
	(0.0414)	(0.0415)	(0.0375)	(0.0530)	(0.102)
Constant	9.702	10.390	11.040	13.300	14.300
	(0.290)	(0.256)	(0.314)	(0.487)	(1.119)
Observations	12,940	9,594	8,897	8,414	4,117
R-squared	0.286	0.234	0.238	0.218	0.176

Notes: Data 2015 National Survey of College Graduates. Coefficients are significant at the 5% level unless otherwise noted; 10 indicates significance at the 10% level; ns indicates not significant at the 10% level.

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